

LOSS CONTROL TOPIC

ROOF SYSTEMS

There are four basic roof types currently in use in commercial applications; shingle, tile, metal and flat. All of these basic types have their own variations due to the different materials used to produce them.

Shingle Roofs

Shingles are used on pitched roofs with the most common being asphalt shingles. Asphalt shingles can have a useful lifespan between 20 to 50 years. Another common roof shingle is referred to as wooden shakes, which are made from cedar, spruce or treated pine that has been split to shingle length. These generally have a 30 year life span. Slate shingles are not often used in commercial applications due to their high cost, but they can have a life span up to as high as 75 years.



Typical asphalt shingle roof



A cedar shake roof

A slate roof



Tile Roofs

Tile roofs are more common in warmer climates and are typically made of clay, concrete or rubber. They are very heavy and usually require a substantial support system. They have a useful lifespan of up to 50 years.



A tile roof being installed

Metal Roofs

Metal roofs are usually made of steel or aluminum with copper being the rare application because of the cost. Steel or aluminum roofs have a useful lifespan of up to 50 years and copper roofs can last up to 100 years.



A raised seam copper roof

Flat Roofs

Flat roofs are a common roof style for commercial applications and are typically one of three types, tar and gravel, asphalt built-up and synthetic membrane. The tar and gravel roof is probably the oldest method of covering a flat roof and one of the most troublesome due to its vulnerability to pooled water and cold temperatures. The application of a tar and gravel roof traditionally utilized heated coal tar, which is a byproduct of the coking process in the coal industry. Gravel is applied on top. An asphalt built up roof utilizes heated asphalt, which is a byproduct of the oil industry. This is applied to successive layers of roofing felt with a gravel top layer. The asphalt built up roof is considered superior to a tar and gravel roof but is vulnerable to oxidation and cracking. Both of these roof systems have a useful life span of about 10 years.

A hot asphalt built-up roof



Membrane Roofs

A membrane roof is usually made of synthetic rubber or a similar flexible waterproof membrane that is laid over an insulating layer and sealed with

adhesive or heat. This type of roof has come to be the preferred roofing system for flat roofs due to its resistance to deterioration and its 20 year life span. It is also usually covered with gravel.

A synthetic membrane roof being applied



There is a unique concept in roofing that has come to be known as the “green” roof and has gained popularity, particularly in urban settings, because it reduces heat and air conditioning costs and reduces carbon dioxide in the atmosphere. The typical application calls for zone appropriate plants in soil over layers of protective membrane. It appears to have the same useful life span as the synthetic membrane roof system.



A “green” roofing system in an urban setting

Maintenance

If there is one word to describe a good preventive maintenance system for roofs it would be inspection. There is no substitute for a thorough visual inspection to uncover potential problems before they develop into costly damages. All roofs should be inspected at least yearly by a qualified roofing contractor and inspected at six month intervals by facilities personnel. There are some common problems to look for during an inspection.

Debris should not be allowed to build up as it traps water, causes deterioration of roofing materials and blocks proper drainage. Debris removal is particularly critical on flat roofs to prevent the ponding of water. Care should be taken to look for debris build up around and under air conditioning units and other roof mechanical systems.



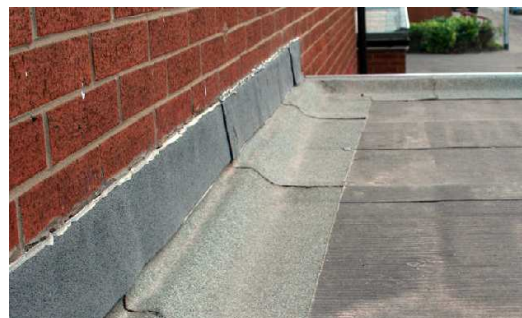
Debris blocking a roof drain



Debris blocking a gutter system

A very large percentage of roof failure is attributed to damaged or deteriorated flashing. Flashing is usually made of aluminum or membrane strips that are adhered to building structures and designed to direct water on to the roofing system

A properly designed and maintained flashing



Pooling of water for one reason or another is sure to cause a premature roof failure if not corrected. It is usually caused by a sagging roof or debris blocking drains as mentioned earlier. It is not a problem to be ignored for long.

Pooled water on a flat roofing system



Blistered, cracked or separated roof surfaces allow water to enter and make its way into the insulation layer and eventually to interior spaces.



A badly cracked and blistered roof membrane

Roof separation



A cracked slate roof



In many instances, roof damage can be caused during the inspection process itself or by inexperienced personnel servicing or installing mechanical systems. It is a good idea to have concrete stepping stones on flat roofs to prevent accidental punctures while walking the roof. Rubber soled shoes should also be worn. Pitched shingle roofs can be visually inspected for defects using binoculars.

With good periodic inspections and follow up maintenance, a properly installed roofing system can protect a building up to and sometimes beyond its average life expectancy.

Remember to have at least a yearly inspection by a qualified roofing contractor. Look for one who is a member of the National Roofing Contractors Association (NFCA) and check their customer references.

Source Materials

National Roofing Contractors Association www.nrca.com

Asphalt Roofing manufacturers Association www.asphaltroofing.org

Structural Engineers Association www.seaint.org

Roof Consultants Institute www.rci-online.com

These guidelines are intended to offer general suggestions for follow up and discussion and should not be considered a substitution for professional advice. You are strongly urged to seek the services of a professional roofing contractor or structural engineer in these areas.

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